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# Westinghouse Electric Company Can Assist with Fukushima Challenges

Presentation to US-Japan Trade Mission  
February 18-19, 2014

# Westinghouse Support to Fukushima

- Provided personal protection equipment and respirators
- Served on INPO Industry Support Team at TEPCO
- Participated on INPO Industry Support Team in Atlanta
- Co-developed conceptual design for Simplified Active Water Retrieval and Recovery System (SARRY) — resulted in successful initial water treatment
- Led unmanned aerial vehicle team at site with Toshiba
- Member of the Toshiba Mt. Fuji Team



T-Hawk Micro Air Vehicle

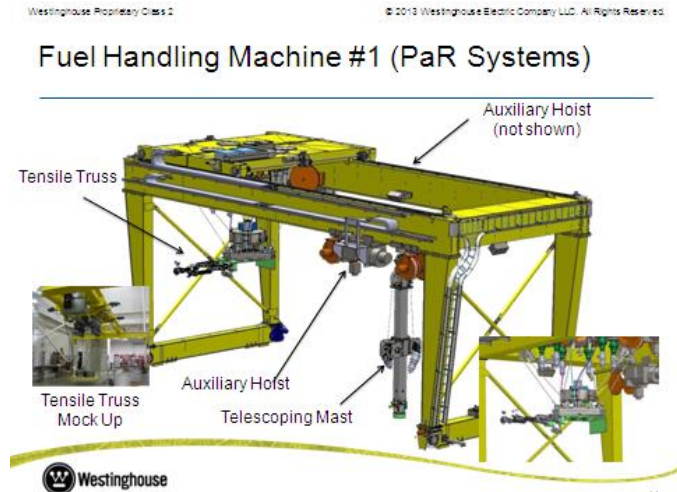
- video and radiation data
- 45 missions



**Westinghouse has been significantly engaged in all aspects of Fukushima response from initial response to now**

# Current Unit 3 Fuel Removal

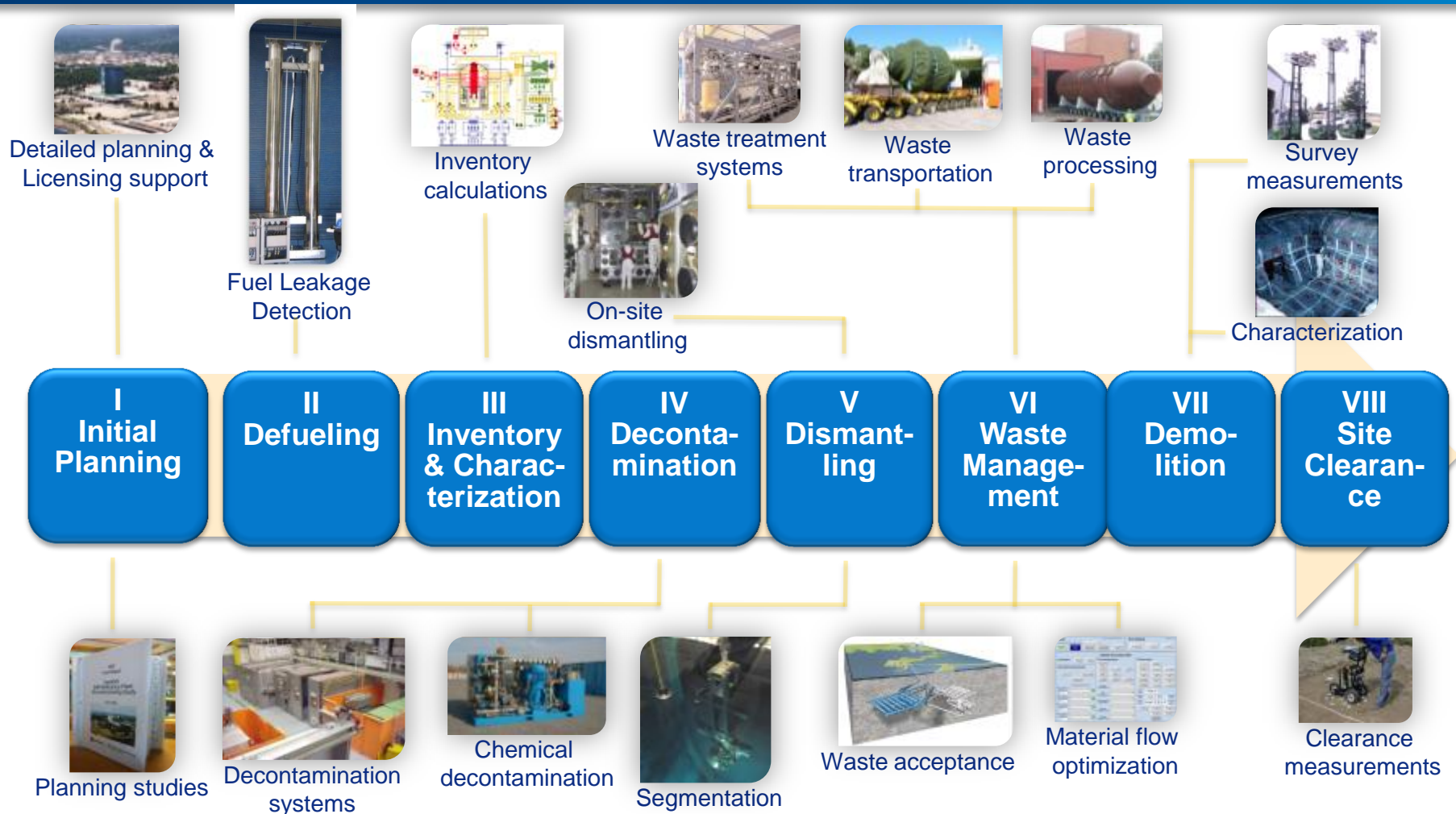
- Complex remote first-of-a-kind machine
- Robotic arms for concrete and metal debris
- Ability to handle damaged fuel
- Fuel Removal and Cask Loading
- Integrated Global Project
  - Toshiba
  - Westinghouse U.S./Japan/Germany
  - Westinghouse Fuel-handling Equipment and Crane Manufacturing
  - Westinghouse Richland Service Center
- FIVE (5) Time Zones
- Multi Languages



**Overcoming an extreme environments in Unit 3 Spent Fuel Pool with unique and versatile global technology**

# Westinghouse & Partners

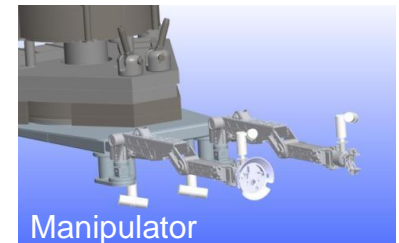
## A Full-scope D&D Provider



**Bringing commercial nuclear decontamination and decommissioning technology and know-how for Fukushima Recovery**

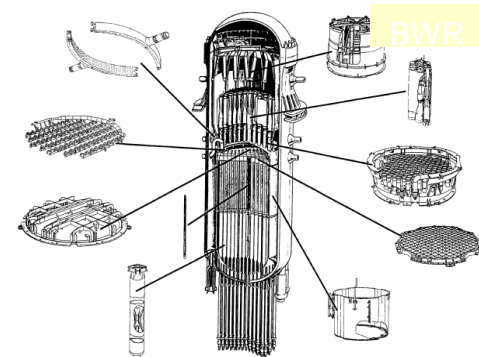
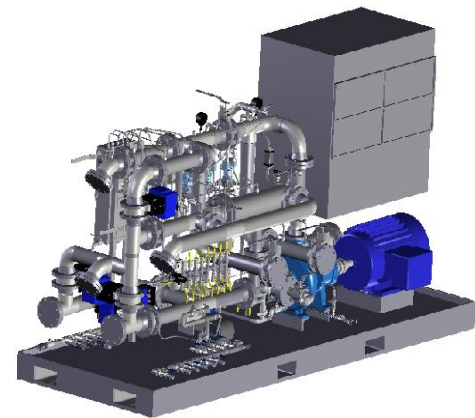
# Extensive Defueling Capabilities & Experiences

- Experience
  - Global refueling support for commercial nuclear reactors
  - Experience from US Three Mile Island defueling (tools, expertise)
  - Manufacturer of nuclear fuel / experienced with U-compound processing
  - Majority owner of Japan's Nuclear Fuel Industries (Tokai, Kumatori, Tokyo)
- Products & Services
  - Cranes and Fuel Handling Machines
  - Fuel handling, Inspection and Repair
  - Cask and canister loading services; canister closure welding
  - Storage canister for failed fuel rods ("Quiver")
  - ROV for Spent Fuel pool cleaning
  - Training Centers
- Innovative Applications for Fukushima
  - Tensile Truss Crane and Manipulator
  - In-Situ Core Dissolution and recovery



# Decontamination & Dismantling Capabilities

- Experience
  - Decontamination for operating (400+) and decommissioned (4) plants
  - Water clean-up and chemical decon processes, including Nitrox-E and DfD
  - Extensive cutting and segmentation experience, including project management, design, planning, development, manufacturing, cutting, packing, handling and cleaning
- Products & Services
  - Soft chemical decontamination
  - Hard chemical decontamination
  - Cutting (thermal, abrasive, mechanical, electrical)
  - Underwater welding (hyperbaric, laser)
- Innovative Applications for Fukushima
  - Specialized decontamination techniques
  - Cutting and segmentation capabilities
  - Minimized waste streams





# Radioactive Waste Management Acceleration

- Experience (many Int'l projects: China examples)

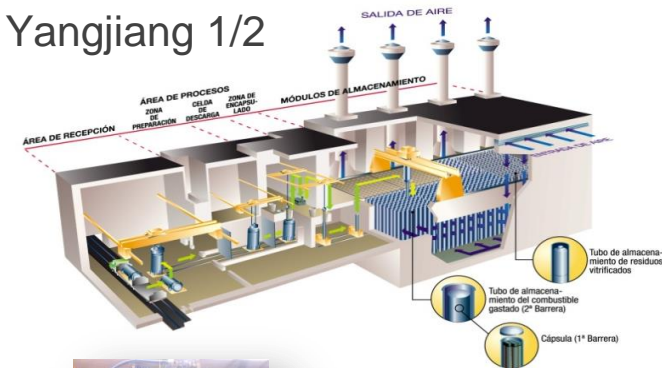
- Cementations, Hongyanhe 1/2, Hongyanhe 3/4, Ningde 1/2, Yangjiang 1/2
- Sorting and Compaction, Hongyanhe 1/2, Ningde 1/2, Yangjiang 1/2
- Sorting and Compaction, Fangjiashan 1/2, Fuqing 1/2
- Grouting Station, Fangchenggang

- Products & Services

- Waste management planning & strategy
- Site waste treatment systems
- Low and intermediate waste disposal facilities
- Spent fuel intermediate storage facilities
- Final repository design for spent fuel

- Applications for Fukushima

- Waste management plan & strategy
- Site waste treatment & disposal



**Drying  
systems**

**Mobile  
systems**

**Liquid  
waste  
treatment  
systems**

**Sorting  
and  
optimizing  
systems**

**Solidificati  
on  
systems**

**Drum  
inspection  
systems**

**Solid  
waste  
compactio  
n systems**

**Handling  
&  
peripheral  
systems**



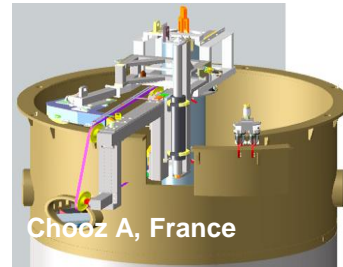


# Recent International Successes

**Sellafield (UK)  
Decommissioning (2013)**



**EDF Chooz A (France) First  
RV dismantling (2010)**



**ISPRA (Italy)  
Decommissioning  
Studies (2010-2014)**



**Fukushima Unit 3  
Spent Fuel  
removal (2012)**



**Bohunice  
Decommissioning  
Plan (2013)**

**Kozloduy (Bulgaria)  
LILW repository design (2011)**



**Zorita RVI and RV  
Segmentation (2011 & 2013)**

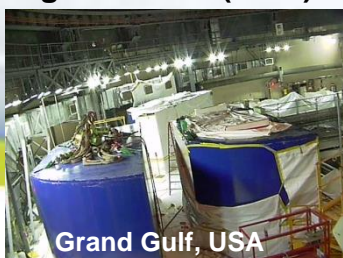


**Centralized  
Interim Storage  
for Spent Fuel  
(2013)**



**4-year operation and  
engineering support  
to El Cabril repository (2013)**

**Grand Gulf (USA)  
Steam Dryer  
segmentation (2012)**



# Why Westinghouse?

- Extensive experience in decontamination, segmentation and waste management
- Proven technology and methods
- Lessons learned from global projects
- Strong project performance
- Innovative approaches, leveraging multifaceted capabilities
- Local deployment / support capabilities
- Enduring commitment to nuclear energy